
Human Cardiovascular Progenitors, their Niches and Control of Self-renewal and Cell Fate

Grant Award Details

Human Cardiovascular Progenitors, their Niches and Control of Self-renewal and Cell Fate

Grant Type: Basic Biology I

Grant Number: RB1-01354

Investigator:

Name:	Robb Maclellan
Institution:	University of California, Los Angeles
Type:	PI

Disease Focus: Heart Disease

Human Stem Cell Use: Adult Stem Cell

Award Value: \$917,667

Status: Closed

Progress Reports

Reporting Period: Year 1

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Reporting Period: Year 2

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Grant Application Details

Application Title: Human Cardiovascular Progenitors, their Niches and Control of Self-renewal and Cell Fate

Public Abstract:

For the millions of Americans who are born with or develop heart disease, stem cell research offers the first hope of reversing or repairing heart muscle damage. Thus, early reports suggesting heart regeneration after transplantation of adult bone marrow-derived stem cells were met with great excitement in both the scientific and lay community. However, although adult stem cell transplantation was shown to be safe, results from over a dozen clinical trials concluded that the benefits were modest at best and whether any true regeneration is occurring was questionable. The basis for these disappointing results may be related to poorly characterized cell types used that have little capacity for true regeneration and an inadequate understanding the factors necessary for survival and differentiation of transplanted stem cells. In this application, we are proposing to study the growth and differentiation properties of an authentic endogenous human cardiac progenitor cell that can differentiate into cardiac muscle cells, smooth muscle cells and endothelial cells. We will also determine the factors that support its growth and renewal during normal development. This knowledge will be applied to future clinical trials of cardiovascular cell therapy that allow truly regenerative therapy.

Statement of Benefit to California:

Heart disease, stroke and other cardiovascular diseases are the #1 killer in California. Despite medical advances, heart disease remains a leading cause of disability and death. Recent estimates of its cost to the U.S. healthcare system amounts to almost \$300 billion dollars. Although current therapies slow the progression of heart disease, there are few, if any options, to reverse or repair damage. Thus, regenerative therapies that restore normal heart function would have an enormous societal and financial impact not only on Californians, but the U.S. more generally. The research that is proposed in this application could lead to new therapies that would restore heart function after heart attack and prevent the development of heart failure and death.

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